

09/976,617

FILE 'HOME' ENTERED AT 09:06:39 ON 29 OCT 2003

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FILE 'WPIDS' ENTERED AT 09:06:53 ON 29 OCT 2003
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FILE 'USPATFULL' ENTERED AT 09:06:53 ON 29 OCT 2003
CA INDEXING COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)

*** YOU HAVE NEW MAIL ***

=> s nanofabrication? (L) oligonucleotides
L1 84 NANOFABRICATION? (L) OLIGONUCLEOTIDES

=> s l1 and nanoparticles
L2 73 L1 AND NANOPARTICLES

=> s l2 and hybridization
L3 72 L2 AND HYBRIDIZATION

=> s l3 and surface
L4 60 L3 AND SURFACE

=> s l4 and surface density
L5 42 L4 AND SURFACE DENSITY

=> s l5 and link?
L6 38 L5 AND LINK?

=> s l6 and recognition
L7 37 L6 AND RECOGNITION

=> d l7 bib abs 1-37

L7 ANSWER 1 OF 37 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-521746 [49] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];
2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];
2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22];
2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45];
2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
2003-634854 [60]
DNN N2003-413913 DNC C2003-140191
TI Detection of nucleic acid having -2 portions used to prepare biomaterials
and in nanofabrication methods, comprises providing **nanoparticles**
, contacting nucleic acid and **nanoparticles**, and observing
change.

09567863

DC B04 D16 S03
IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J;
TATON, T A
PA (NANO-N) NANOSPHERE INC
CYC 1
PI US 2003044805 A1 20030306 (200349)* 130p
ADT US 2003044805 A1 Provisional US 1996-31809P 19960729, CIP of WO
1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US
1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US
2000-603830 20000626, US 2001-981344 20011015
FDT US 2003044805 A1 CIP of US 6361944
PRAI US 2001-981344 20011015; US 1996-31809P 19960729; WO 1997-US12783
19970721; US 1999-240755 19990129; US 1999-344667 19990625; US
2000-200161P 20000426; US 2000-603830 20000626
AN 2003-521746 [49] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];
2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];
2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22];
2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45];
2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
2003-634854 [60]
AB US2003044805 A UPAB: 20030919
NOVELTY - Nucleic acid having at least 2 portions is detected by providing
type of **nanoparticles** having **oligonucleotides**,
contacting nucleic acid and **nanoparticles** under conditions that
allow **hybridization** of **oligonucleotides** on
nanoparticles, and observing detectable change brought about by
the **hybridization**.
DETAILED DESCRIPTION - The detection of nucleic acid having at least
2 portions involves providing type of **nanoparticles** having
oligonucleotides, contacting the nucleic acid and the
nanoparticles under conditions that allow **hybridization**
of **oligonucleotides** on **nanoparticles**, and observing
detectable change brought about by the **hybridization**. The
oligonucleotides on each nanoparticle have a sequence
complementary to the sequence of at least 2 portions of the nucleic acid.
INDEPENDENT CLAIMS are also included for:
(1) a kit comprising container(s) that holds a composition having at
least 2 types of **nanoparticles** with an attached
oligonucleotides with the **oligonucleotides** on the first
type of **nanoparticles** having sequence complementary to that of
the first portion of the nucleic acid and that of the second type having
sequence complementary to that of the second portion of the nucleic acid;
(2) an aggregate probe comprising at least 2 types of
nanoparticles bound to each other as result of the
hybridization of some of the **oligonucleotides** attached
to them with the type(s) of **nanoparticles** of the probe having
attached **oligonucleotides** that have sequence complementary to
the portion of the sequence of the nucleic acid;
(3) a core probe comprising at least 2 types of **nanoparticles**
having attached **oligonucleotides** with the probe's
nanoparticles being bound to each other as result of
hybridization of some of the **oligonucleotides**;
(4) a substrate having attached **nanoparticles**;
(5) a metallic or semiconductor nanoparticle having attached
oligonucleotides labeled with fluorescent molecules at ends not
attached to the nanoparticle;
(6) a satellite probe comprising a particle having attached
oligonucleotides with first and second portions both having
sequences complementary to portions of the sequence of nucleic acid;
(7) **nanofabrication** comprising providing **linking**
oligonucleotide(s) having selected sequence with at least 2 portions,

providing the type(s) of **nanoparticles**, and contacting the **linking oligonucleotides** and the **nanoparticles** under conditions that allow **hybridization** of the **oligonucleotides** on the **nanoparticles** to the **linking oligonucleotides** so that a desired nanomaterial or nanostructure is formed with the **nanoparticles** held together by oligonucleotide connectors;

(8) nanomaterials or nanostructures composed of the **nanoparticles** and held together by the connectors;

(9) a composition comprising the at least 2 types of **nanoparticles**;

(10) an assembly of containers comprising first and second containers holding the **nanoparticles** attached with the **oligonucleotides**;

(11) separating a selected nucleic acid comprising providing the at least 2 types of **nanoparticles** and contacting the nucleic acids and the **nanoparticles** under conditions that allow **hybridization** of the **oligonucleotides** on the **nanoparticles** with the selected nucleic acid so that the **nanoparticles** hybridized to the selected nucleic acid aggregate and precipitate;

(12) binding the **oligonucleotides** to charged **nanoparticles** to produce stable nanoparticle-oligonucleotide conjugates comprising providing **oligonucleotides** having covalently bound moiety with functional group that can bind to the **nanoparticles**, contacting the **oligonucleotides** and the **nanoparticles** in water for a time to allow some of the **oligonucleotides** to bind to the **nanoparticles**, adding salt(s) to the water to form salt solution with an ionic strength that overcomes partially electrostatic attraction or repulsion of the **oligonucleotides** for each other and for the **nanoparticles**, and contacting the **oligonucleotides** and the **nanoparticles** in the salt solution for an additional time to allow additional **oligonucleotides** to bind to the **nanoparticles** to produce the stable conjugates; and

(13) nanoparticle-oligonucleotide conjugates which are **nanoparticles** having attached **oligonucleotides** at the particles **surface** at a **surface density** for the conjugates to be stable.

USE - Used for detecting nucleic acids.

ADVANTAGE - The invention can provide highly desirable nanoparticle-oligonucleotide conjugates. These conjugates are stable with tailored **hybridization** abilities.

DESCRIPTION OF DRAWING(S) - The figure is a schematic diagram illustrating formation of nanoparticle aggregates by combining **nanoparticles** having attached complementary **oligonucleotides**.

Dwg.1/41.

L7 ANSWER 2 OF 37 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
 AN 2002-258024 [30] WPIDS
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];
 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
 2003-634854 [60]
 DNC C2002-076817
 TI Detecting nucleic acid, useful for diagnosis of genetic, viral or bacterial disease, comprises hybridizing **nanoparticles** with attached oligonucleotides to nucleic acid and detecting change brought about by **hybridization**.

DC B04 D16
 IN ELGHANIAN, R; GARIMELLA, V; LETSINGER, R L; LI, Z; MIRKIN, C A; MUCIC, R
 C; PARK, S; STORHOFF, J J; TATON, T A
 PA (NANO-N) NANOSPHERE INC
 CYC 95
 PI WO 2002018643 A2 20020307 (200230)* EN 329p
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ
 NL OA PT SD SE SL SZ TR TZ UG ZW
 W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK
 DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR
 KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU
 SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
 AU 2001081248 A 20020313 (200249)
 ADT WO 2002018643 A2 WO 2001-US25237 20010810; AU 2001081248 A AU 2001-81248
 20010810
 FDT AU 2001081248 A Based on WO 2002018643
 PRAI US 2001-820279 20010328; US 2000-224631P 20000811; US 2000-254392P
 20001208; US 2000-255235P 20001211; US 2001-760500 20010112
 AN 2002-258024 [30] WPIDS
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];
 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
 2003-634854 [60]
 AB WO 200218643 A UPAB: 20030919
 NOVELTY - Detecting a nucleic acid (NA) having at least 2 portions
 comprising:
 (a) providing **nanoparticles** (NP) with attached
oligonucleotides (OGN), where OGN has a sequence complementary to
 the sequence of NA;
 (b) contacting NA and NP under conditions effective to allow
hybridization of OGN with NA; and
 (c) observing a detectable change brought about by
hybridization of OGN with NA, is new.
 DETAILED DESCRIPTION - Detecting (M1) a nucleic acid (NA) having at
 least 2 portions comprising:
 (a) providing 2 types of **nanoparticles** (NP) with attached
oligonucleotides (OGN), where OGN on type 1 has a sequence
 complementary to a first portion of the sequence of NA and OGN on type 2
 has a sequence complementary to a second portion of the sequence of NA;
 (b) contacting NA and NP under conditions effective to allow
hybridization of OGN with NA; and
 (c) observing a detectable change brought about by
hybridization of OGN with NA, is new.
 INDEPENDENT CLAIMS are also included for the following:
 (1) a kit for carrying out M1;
 (2) an aggregate probe comprising at least 2 types of NP having OGN
 attached, bound to each other as a result of **hybridization** of
 OGN and OGN comprises sequence complementary to a portion of NA or a
 hydrophobic group attached to the NP free end;
 (3) a core probe comprising at least 2 types of NP having OGN
 attached, bound to each other as a result of **hybridization** of
 OGN;
 (4) a substrate having NP attached;
 (5) a metallic or semiconductor NP having OGN attached, where OGN are
 labeled with fluorescent molecules at NP free ends;
 (6) a satellite probe comprising a particle having OGN attached and
 probe OGN hybridized to OGN on NP;
 (7) a method (M2) of **nanofabrication** comprising:
 (a) providing a **linking** OGN having a selected sequence of 2
 portions;

(b) providing NP having OGN attached, where OGN comprises a sequence complementary to the **linking** OGN; and

(c) contacting **linking** OGN and NP under **hybridization** conditions so that a desired nanomaterial or nanostructure is formed where NP are held together by OGN connectors;

(8) nanomaterials or nanostructures composed of NP having OGN attached, where NP are held together by OGN connectors;

(9) an assembly of containers comprising containers holding NP with OGN attached;

(10) a NP having a number of different OGN attached;

(11) separating (M3) a selected NA having 2 portions;

(12) binding (M4) OGN to charged NP to produce stable NP-OGN conjugates;

(13) NP-OGN conjugates comprising OGN attached to NP at a **surface density** sufficient so that the conjugates are stable, where OGN has sequence complementary to a NA or another OGN;

(14) detecting a NA using the NP-OGN conjugates;

(15) a method of **nanofabrication** using the NP-OGN conjugates;

(16) separating a selected NA using the NP-OGN conjugates;

(17) NP-OGN conjugates which are NP having OGN attached, where OGN have a covalently bound cyclic disulfide functional group or polythiol functional group that can bind to NP;

(18) OGN having a covalently bound cyclic disulfide functional group or polythiol functional group that can bind NP; and

(19) detecting (M5) an analyte in a sample.

USE - The methods are useful for detecting a nucleic acid, separating a selected nucleic acid from others and methods of nanofabrication (all claimed). Detecting analytes such as nucleic acids and proteins are useful for the diagnosis of genetic, bacterial and viral diseases.

ADVANTAGE - The OGN-NP conjugates that use cyclic disulfide linkers improve the sensitivity of diagnostic assays. In particular assays using OGN-NP conjugates prepared using linkers comprising a steroid residue attached to a cyclic disulfide have been found to be approx. 10 times more sensitive than assays employing conjugates prepared using alkanethiols or acyclic disulfides as the linker. The OGN-NP conjugates are stable allowing them to be used directly in PCR solutions. Therefore conjugates added as probes to a DNA target to be PCR amplified can be carried through the 30 or 40 heating cooling cycles of the PCR and are still able to detect the amplicons without opening the tubes. Opening the tubes for addition of probes after PCR can cause serious problems through contamination of the equipment to be used for subsequent tests.
Dwg.0/64

L7 ANSWER 3 OF 37 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2001-451868 [48] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-656926 [75]; 2002-258024 [30];
2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];
2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];
2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];
2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
2003-634854 [60]

DNC C2001-136537

TI Detecting a nucleic acid useful in e.g. diagnosing genetic, bacterial or viral diseases, by contacting the nucleic acid with oligonucleotides attached to **nanoparticles** and having sequences complementary a portion of the nucleic acid.

DC B04 D16

IN ELGHANIAN, R; GARIMELLA, V; LETSINGER, R L; LI, Z; MIRKIN, C A; MUCIC, R C; STORHOFF, J J; TATON, T A

PA (NANO-N) NANOSPHERE INC; (ELGH-I) ELGHANIAN R; (GARI-I) GARIMELLA V; (LETS-I) LETSINGER R L; (LIZZ-I) LI Z; (MIRK-I) MIRKIN C A; (MUCI-I) MUCIC

09567863

R C; (STOR-I) STORHOFF J J; (TATO-I) TATON T A
CYC 95
PI WO 2001051665 A2 20010719 (200148)* EN 229p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ
NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM
DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE
SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001032795 A 20010724 (200166)
US 2002127574 A1 20020912 (200262)
US 2002155442 A1 20021024 (200277)
US 6506564 B1 20030114 (200313)
EP 1294930 A2 20030326 (200323) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI TR
US 2003054358 A1 20030320 (200323)
US 2003059777 A1 20030327 (200325)
US 2003143538 A1 20030731 (200354)
ADT WO 2001051665 A2 WO 2001-US1190 20010112; AU 2001032795 A AU 2001-32795
20010112; US 2002127574 A1 Provisional US 1996-31809P 19960729, CIP of WO
1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US
1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US
2000-603830 20000626, US 2001-973788 20011010; US 2002155442 A1
Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP
of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US
2000-176409P 20000113, Provisional US 2000-200161P 20000426, Provisional
US 2000-213906P 20000626, US 2001-760500 20010112; US 6506564 B1
Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP
of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US
2000-200161P 20000426, US 2000-603830 20000626; EP 1294930 A2 EP
2001-904855 20010112, WO 2001-US1190 20010112; US 2003054358 A1
Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP
of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US
2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-975376
20011011; US 2003059777 A1 Provisional US 1996-31809P 19960729, CIP of WO
1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US
1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US
2000-603830 20000626, US 2001-957313 20010920; US 2003143538 A1
Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP
of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US
2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-975059
20011011
FDT AU 2001032795 A Based on WO 2001051665; US 2002127574 A1 CIP of US
6361944; US 2002155442 A1 CIP of US 6361944; EP 1294930 A2 Based on WO
2001051665; US 2003054358 A1 CIP of US 6361944; US 2003059777 A1 CIP of US
6361944; US 2003143538 A1 CIP of US 6361944, Cont of US 6506564
PRAI US 2001-760500 20010112; US 2000-176409P 20000113; US 2000-200161P
20000426; US 2000-603830 20000626; US 1996-31809P 19960729; WO
1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667
19990625; US 2001-973788 20011010; US 2000-213906P 20000626; US
2001-975376 20011011; US 2001-957313 20010920; US 2001-975059
20011011
AN 2001-451868 [48] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-656926 [75]; 2002-258024 [30];
2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];
2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];
2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];
2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
2003-634854 [60]
AB WO 200151665 A UPAB: 20030919
NOVELTY - Detecting a nucleic acid having at least 2 portions, comprises

contacting the nucleic acid with one or more types of **nanoparticles** having **oligonucleotides** attached to the **nanoparticles** and having sequences complementary to portions of the sequence of the nucleic acid.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) methods of detecting a nucleic acid having at least 2 portions comprising:

(a) contacting the nucleic acid with one or more types of **nanoparticles** having **oligonucleotides** attached to the **nanoparticles** and having sequences complementary to portions of the sequence of the nucleic acid, under conditions allowing the **hybridization** of the **oligonucleotides** on the **nanoparticles** with the nucleic acid; and

(b) observing a detectable change brought about by **hybridization** of the **oligonucleotides** on the **nanoparticles** with the nucleic acid;

(2) kits comprising at least one container holding a composition containing at least 2 types of **nanoparticles** having **oligonucleotides** attached to it, where the first type has a sequence complementary to the sequence of a first portion of a nucleic acid, and the **oligonucleotides** on the second type of **nanoparticles** has a sequence complementary to the sequence of a second portion of the nucleic acid;

(3) an aggregate probe comprising at least 2 types of **nanoparticles** having **oligonucleotides** attached to it, the **nanoparticles** of the aggregate probe are bound to each other as a result of the **hybridization** of some of the **oligonucleotides** attached to them, and at least one of the **nanoparticles** of the aggregate probe having **oligonucleotides** attached to it which have a hydrophobic group on the end not attached to the **nanoparticles**;

(4) a kit comprising a container holding a core probe having at least 2 types of **nanoparticles** having **oligonucleotides** attached to it and the **nanoparticles** of the core probe is bound to each other as a result of the **hybridization** of some of the **oligonucleotides** attached to them;

(5) a core probe comprising at least 2 types of **nanoparticles** having **oligonucleotides** attached to it;

(6) a substrate having **nanoparticles** attached to it;

(7) a metallic or semiconductor nanoparticle having **oligonucleotides** attached to it which are labeled with fluorescent molecule at the end not attached to the nanoparticle;

(8) a satellite probe comprising a particle having attached **oligonucleotides**, and probe **oligonucleotides** hybridized to the **oligonucleotides** attached to the **nanoparticles**;

(9) methods of **nanofabrication**;

(10) nanomaterials or nanostructures composed of **nanoparticles** having **oligonucleotides** attached to it and being held by oligonucleotide connectors;

(11) a composition comprising at least 2 types of **nanoparticles** having **oligonucleotides** attached to it;

(12) an assembly of containers holding **nanoparticles** having **oligonucleotides** attached to them;

(13) a nanoparticle having multiple **oligonucleotides** attached to it;

(14) a method of separating a selected nucleic acid having at least 2 portions from other nucleic acid;

(15) methods of binding **oligonucleotides** to charged **nanoparticles** to produce stable nanoparticle-oligonucleotide conjugates;

(16) nanoparticle-oligonucleotide conjugates which are

nanoparticles having **oligonucleotides** attached to them, where the **oligonucleotides** are present on the **surface** of the **nanoparticles** at a **surface density** sufficient so that the conjugates are stable, and at least some of the **oligonucleotides** have sequences complementary to at least one portion of the nucleic acid or oligonucleotide sequence;

(17) **nanoparticles** having **oligonucleotides** attached to them which comprises at least one type of **recognition oligonucleotides** having a sequence complementary to a portion of the nucleic acid sequence, and a type of diluent **oligonucleotides**; and

(18) methods of detecting a nucleic acid.

USE - The methods are useful for detecting nucleic acids, natural or synthetic, and modified or unmodified. The methods may also be applied in the diagnosis of genetic, bacterial and viral diseases, in forensics, in DNA sequencing, for paternity testing, for cell line authentication, and for monitoring gene therapy. The methods are further useful in research and analytical laboratories in DNA sequencing, in the field to detect the presence of specific pathogens, for quick identification of an infection to assist in drug prescription, and in homes and health centers for inexpensive first-line screening.

ADVANTAGE - The methods, which are based on observing color change with the naked eye, are cheap, fast, simple, robust (reagents are stable), do not require specialized or expensive equipment, and little or no instrumentation is required.

Dwg.0/46

L7 ANSWER 4 OF 37 USPATFULL on STN
 AN 2003:257732 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Bloomington, IN, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003180783 A1 20030925
 AI US 2003-410324 A1 20030409 (10)
 RLI Continuation of Ser. No. US 2001-961949, filed on 20 Sep 2001, GRANTED, Pat. No. US 6582921 Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING
 PRAI US 1996-31809P 19960729 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 31 Drawing Page(s)
 LN.CNT 8062
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of

the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 5 OF 37 USPATFULL on STN
 AN 2003:213644 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003148282 A1 20030807
 AI US 2001-976968 A1 20011012 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8043

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 6 OF 37 USPATFULL on STN
 AN 2003:207246 USPATFULL
 TI Real-time monitoring of PCR amplification using nanoparticle probes
 IN Storhoff, James J., Evanston, IL, UNITED STATES
 Fritz, Brett, Chicago, IL, UNITED STATES
 Herrmann, Mark, Clinton, UT, UNITED STATES
 PI US 2003143604 A1 20030731
 AI US 2002-306630 A1 20021127 (10)
 PRAI US 2001-334644P 20011130 (60)
 DT Utility
 FS APPLICATION
 LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
 3200, CHICAGO, IL, 60606
 CLMN Number of Claims: 91
 ECL Exemplary Claim: 1
 DRWN 12 Drawing Page(s)
 LN.CNT 2116

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to the use of nanoparticle detection probes to monitor amplification reactions, especially polymerase chain reactions ("PCR"). More specifically, the present invention involves the use of **nanoparticles** oligonucleotide conjugates treated with a protective agent such as bovine serum albumin in an homogeneous assay format in order to quantitatively and qualitatively detect a target polynucleotide.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 7 OF 37 USPATFULL on STN
 AN 2003:207180 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003143538 A1 20030731
 AI US 2001-975059 A1 20011011 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED
 Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8062

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods

comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 8 OF 37 USPATFULL on STN
 AN 2003:187818 USPATFULL
 TI Non-alloying core shell **nanoparticles**
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Cao, Yun-Wei, Evanston, IL, UNITED STATES
 Jin, Rongchao, Evanston, IL, UNITED STATES
 PI US 2003129608 A1 20030710
 AI US 2002-153483 A1 20020522 (10)
 RLI Continuation-in-part of Ser. No. US 2001-34451, filed on 28 Dec 2001,
 PENDING
 PRAI WO 2001-US50825 20011228
 US 2001-293861P 20010525 (60)
 DT Utility
 FS APPLICATION
 LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
 3200, CHICAGO, IL, 60606
 CLMN Number of Claims: 38
 ECL Exemplary Claim: 1
 DRWN 9 Drawing Page(s)
 LN.CNT 1113

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates composite core/shell **nanoparticles** and a two-step method for their preparation. The present invention further relates to biomolecule-core/shell nanoparticle conjugates and methods for their preparation. The invention also relates to methods of detection of biomolecules comprising the biomolecule-core/shell nanoparticle conjugates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 9 OF 37 USPATFULL on STN
 AN 2003:180699 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and
 uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003124528 A1 20030703
 AI US 2001-976601 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)

DT Utility
FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431
ECL Exemplary Claim: 1
DRWN 46 Drawing Page(s)
LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides methods of
synthesizing unique nanoparticle-oligonucleotide conjugates, the
conjugates produced by the methods, and methods of using the conjugates.
In addition, the invention provides nanomaterials and nanostructures
comprising **nanoparticles** and methods of
nanofabrication utilizing **nanoparticles**. Finally, the
invention provides a method of separating a selected nucleic acid from
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 10 OF 37 USPATFULL on STN

AN 2003:127030 USPATFULL

TI Nanoparticles having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
Lu, Gang, Mt Prospect, IL, UNITED STATES

PI US 2003087242 A1 20030508

AI US 2001-8978 A1 20011207 (10)

RLI Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug 2001,
PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar
2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on
12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830,
filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US
1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944
Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999,
ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21
Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-192699P 20000328 (60)
US 2000-200161P 20000426 (60)
US 2000-213906P 20000626 (60)
US 2000-224631P 20000811 (60)
US 2000-254392P 20001208 (60)
US 2000-254418P 20001208 (60)

09567863

US 2000-255235P 20001211 (60)
US 2000-255236P 20001211 (60)
US 2001-282640P 20010409 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
3200, CHICAGO, IL, 60606

CLMN Number of Claims: 626

ECL Exemplary Claim: 1

DRWN 71 Drawing Page(s)

LN.CNT 12308

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 11 OF 37 USPATFULL on STN

AN 2003:99517 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2003068622 A1 20030410

AI US 2001-976863 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8059

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of

the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 12 OF 37 USPATFULL on STN
 AN 2003:86172 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003059777 A1 20030327
 AI US 2001-957313 A1 20010920 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from

09567863

other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 13 OF 37 USPATFULL on STN
AN 2003:78438 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES
PA Nanosphere, Inc. (U.S. corporation)
PI US 2003054358 A1 20030320
AI US 2001-975376 A1 20011011 (9)
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)
DT Utility
FS APPLICATION
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 431
ECL Exemplary Claim: 1
DRWN 46 Drawing Page(s)
LN.CNT 8059
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides methods of
synthesizing unique nanoparticle-oligonucleotide conjugates, the
conjugates produced by the methods, and methods of using the conjugates.
In addition, the invention provides nanomaterials and nanostructures
comprising **nanoparticles** and methods of
nanofabrication utilizing **nanoparticles**. Finally, the
invention provides a method of separating a selected nucleic acid from
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 14 OF 37 USPATFULL on STN
AN 2003:71346 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES

Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc.
 PI US 2003049631 A1 20030313
 AI US 2001-974500 A1 20011010 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
 GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
 Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 172
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 6565

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods
 comprise (contacting the nucleic acid with one or more types of
 particles having **oligonucleotides** attached thereto, In one
 embodiment of the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
 the sequence of the nucleic acid. A detectable change (preferably a
 color change) is brought about as a result of the **hybridization**
 of the **oligonucleotides** on the **nanoparticles** to the
 nucleic acid. The invention also provides compositions and kits
 comprising particles The invention further provides nanomaterials and
 ianostructures comprising **nanoparticles** and methods of
nanofabrication utilizing the **nanoparticles**. Finally,
 the invention provides a method of separating a selected nucleic acid
 from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 15 OF 37 USPATFULL on STN
 AN 2003:71345 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and
 uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2003049630 A1 20030313
 AI US 2001-957318 A1 20010920 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
 GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
 Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431

09567863

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8041

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 16 OF 37 USPATFULL on STN

AN 2003:64684 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C, Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2003044805 A1 20030306

AI US 2001-981344 A1 20011015 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8061

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits

comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 17 OF 37 USPATFULL on STN
 AN 2003:30222 USPATFULL
 TI Nanoparticles having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Park, So-Jung, Evanston, IL, UNITED STATES
 PI US 2003022169 A1 20030130
 AI US 2001-820279 A1 20010328 (9)
 RLI Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001,
 PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun
 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-176409P 20000113 (60)
 US 2000-200161P 20000426 (60)
 US 2000-192699P 20000328 (60)
 US 2000-254392P 20001208 (60)
 US 2000-255235P 20001211 (60)
 DT Utility
 FS APPLICATION
 LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
 3200, CHICAGO, IL, 60606
 CLMN Number of Claims: 570
 ECL Exemplary Claim: 1
 DRWN 65 Drawing Page(s)
 LN.CNT 11127

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.F

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 18 OF 37 USPATFULL on STN
 AN 2003:13189 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and
 uses therefor
 IN Mirkin, Chad A., Wilmette, IL, United States

Letsinger, Robert L., Wilmette, IL, United States
 Mucic, Robert C., Glendale, CA, United States
 Storhoff, James J., Evanston, IL, United States
 Elghanian, Robert, Chicago, IL, United States
 Taton, Thomas A., Chicago, IL, United States
 PA Nanosphere, Inc., Northbrook, IL, United States (U.S. corporation)
 PI US 6506564 B1 20030114
 AI US 2000-603830 20000626 (9)
 RLI Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999
 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999
 Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997
 PRAI US 2000-200161P 20000426 (60)
 US 1996-31809P 19960729 (60)
 DT Utility
 FS GRANTED
 EXNAM Primary Examiner: Riley, Jezia
 LREP McDonnell Boehnen Hulbert & Berghoff
 CLMN Number of Claims: 42
 ECL Exemplary Claim: 1
 DRWN 84 Drawing Figure(s); 47 Drawing Page(s)
 LN.CNT 5976

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 19 OF 37 USPATFULL on STN
 AN 2002:337329 USPATFULL
 TI Bio-barcodes based on oligonucleotide-modified **nanoparticles**
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Park, So-Jung, Evanston, IL, UNITED STATES
 Nam, Jwa-Min, Evanston, IL, UNITED STATES
 PI US 2002192687 A1 20021219
 AI US 2002-108211 A1 20020327 (10)
 RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001,
 PENDING
 PRAI WO 2001-US10071 20010328
 US 2000-192699P 20000328 (60)
 US 2001-350560P 20011113 (60)
 DT Utility
 FS APPLICATION
 LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
 3200, CHICAGO, IL, 60606
 CLMN Number of Claims: 41
 ECL Exemplary Claim: 1
 DRWN 4 Drawing Page(s)

09567863

LN.CNT 2185

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to a screening methods, compositions, and kits for detecting for the presence or absence of one or more target analytes, e.g. proteins such as antibodies, in a sample. In particular, the present invention relates to a method that utilizes reporter oligonucleotides as biochemical barcodes for detecting multiple protein structures or other target analytes in one solution.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 20 OF 37 USPATFULL on STN

AN 2002:322449 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2002182613 A1 20021205

AI US 2001-976971 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 172

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 6563

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing the **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 21 OF 37 USPATFULL on STN

AN 2002:322447 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES

Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES
PA Nanosphere, Inc. (U.S. corporation)
PI US 2002182611 A1 20021205
US 6610491 B2 20030826
AI US 2001-966491 A1 20010928 (9)
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
3200, CHICAGO, IL, 60606
CLMN Number of Claims: 190
ECL Exemplary Claim: 1
DRWN 46 Drawing Page(s)
LN.CNT 6646
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides nanomaterials and
nanostructures comprising **nanoparticles** and methods of
nanofabrication utilizing the **nanoparticles**. Finally,
the invention provides a method of separating a selected nucleic acid
from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 22 OF 37 USPATFULL on STN
AN 2002:314666 USPATFULL
TI Non-alloying core shell **nanoparticles**
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Cao, Yun-Wei, Evanston, IL, UNITED STATES
Jin, Rongchao, Evanston, IL, UNITED STATES
PI US 2002177143 A1 20021128
AI US 2001-34451 A1 20011228 (10)
PRAI US 2001-293861P 20010525 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
3200, CHICAGO, IL, 60606
CLMN Number of Claims: 35
ECL Exemplary Claim: 1
DRWN 7 Drawing Page(s)
LN.CNT 1075
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates composite core/shell **nanoparticles**
and a two-step method for their preparation. The present invention

further relates to biomolecule-core/shell nanoparticle conjugates and methods for their preparation. The invention also relates to methods of detection of biomolecules comprising the biomolecule or specific binding substance-core/shell nanoparticle conjugates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 23 OF 37 USPATFULL on STN
 AN 2002:307830 USPATFULL
 TI Movement of biomolecule-coated nanoparticles in an electric field
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Chicago, IL, UNITED STATES
 Taton, Thomas Andrew, Chicago, IL, UNITED STATES
 Garimella, Viswanadham, Evanston, IL, UNITED STATES
 Li, Zhi, Evanston, IL, UNITED STATES
 Park, So-Jung, Evanston, IL, UNITED STATES
 PI US 2002172953 A1 20021121
 AI US 2001-927777 A1 20010810 (9)
 RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001,
 PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan
 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on
 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667,
 filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part
 of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED
 Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997,
 UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-176409P 20000113 (60)
 US 2000-200161P 20000426 (60)
 US 2000-192699P 20000328 (60)
 US 2000-254392P 20001208 (60)
 US 2000-255235P 20001211 (60)
 US 2000-224631P 20000811 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
 Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 598
 ECL Exemplary Claim: 1
 DRWN 64 Drawing Page(s)
 LN.CNT 11435

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods
 comprise contacting the nucleic acid with one or more types of particles
 having oligonucleotides attached thereto. In one embodiment of the
 method, the oligonucleotides are attached to nanoparticles and have
 sequences complementary to portions of the sequence of the nucleic acid.
 A detectable change (preferably a color change) is brought about as a
 result of the hybridization of the oligonucleotides on the nanoparticles
 to the nucleic acid. The invention also provides compositions and kits
 comprising particles. The invention further provides methods of
 synthesizing unique nanoparticle-oligonucleotide conjugates, the
 conjugates produced by the methods, and methods of using the conjugates.
 In addition, the invention provides nanomaterials and nanostructures
 comprising nanoparticles and methods of nanofabrication utilizing
 nanoparticles. Finally, the invention provides a method of separating a
 selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 24 OF 37 USPATFULL on STN
AN 2002:294562 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Chicago, IL, UNITED STATES
Taton, Thomas A., Chicago, IL, UNITED STATES
PA Nanosphere, Inc. (U.S. corporation)
PI US 2002164605 A1 20021107
AI US 2001-966312 A1 20010928 (9)
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
3200, CHICAGO, IL, 60606
CLMN Number of Claims: 431
ECL Exemplary Claim: 1
DRWN 46 Drawing Page(s)
LN.CNT 8066
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides methods of
synthesizing unique nanoparticle-oligonucleotide conjugates, the
conjugates produced by the methods, and methods of using the conjugates.
In addition, the invention provides nanomaterials and nanostructures
comprising **nanoparticles** and methods of
nanofabrication utilizing **nanoparticles**. Finally, the
invention provides a method of separating a selected nucleic acid from
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 25 OF 37 USPATFULL on STN
AN 2002:287518 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
PA Nanosphere, Inc. (U.S. corporation)
PI US 2002160381 A1 20021031

09567863

AI US 2001-975498 A1 20011011 (9)
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
PENDING Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan
1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed
on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)
DT Utility
FS APPLICATION
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 431
ECL Exemplary Claim: 1
DRWN 46 Drawing Page(s)
LN.CNT 5695

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides methods of
synthesizing unique nanoparticle-oligonucleotide conjugates, the
conjugates produced by the methods, and methods of using the conjugates.
In addition, the invention provides nanomaterials and nanostructures
comprising **nanoparticles** and methods of
nanofabrication utilizing **nanoparticles**. Finally, the
invention provides a method of separating a selected nucleic acid from
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 26 OF 37 USPATFULL on STN
AN 2002:280028 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
PA Nanosphere, Inc. (U.S. corporation)
PI US 2002155462 A1 20021024
AI US 2001-976577 A1 20011012 (9)
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)
DT Utility
FS APPLICATION
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 431

09567863

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8047

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 27 OF 37 USPATFULL on STN

AN 2002:280027 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2002155461 A1 20021024

AI US 2001-976378 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8052

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits

comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 28 OF 37 USPATFULL on STN
 AN 2002:280025 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2002155459 A1 20021024
 AI US 2001-975062 A1 20011011 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8059

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 29 OF 37 USPATFULL on STN
 AN 2002:280024 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2002155458 A1 20021024

AI US 2001-967409 A1 20010928 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE
3200, CHICAGO, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8059

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods
comprise contacting the nucleic acid with one or more types of particles
having **oligonucleotides** attached thereto. In one embodiment of
the method, the **oligonucleotides** are attached to
nanoparticles and have sequences complementary to portions of
the sequence of the nucleic acid. A detectable change (preferably a
color change) is brought about as a result of the **hybridization**
of the **oligonucleotides** on the **nanoparticles** to the
nucleic acid. The invention also provides compositions and kits
comprising particles. The invention further provides methods of
synthesizing unique nanoparticle-oligonucleotide conjugates, the
conjugates produced by the methods, and methods of using the conjugates.
In addition, the invention provides nanomaterials and nanostructures
comprising **nanoparticles** and methods of
nanofabrication utilizing **nanoparticles**. Finally, the
invention provides a method of separating a selected nucleic acid from
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 30 OF 37 USPATFULL on STN

AN 2002:280008 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and
uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Chicago, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES
Garimella, Viswanadham, Evanston, IL, UNITED STATES
Li, Zhi, Evanston, IL, UNITED STATES

PI US 2002155442 A1 20021024

AI US 2001-760500 A1 20010112 (9)

RLI Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,

GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 US 2000-176409P 20000113 (60)
 US 2000-213906P 20000626 (60)

DT Utility
 FS APPLICATION
 LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606
 CLMN Number of Claims: 485
 ECL Exemplary Claim: 1
 DRWN 51 Drawing Page(s)
 LN.CNT 8754
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 31 OF 37 USPATFULL on STN
 AN 2002:265844 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2002146720 A1 20021010
 US 6582921 B2 20030624
 AI US 2001-961949 A1 20010920 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)

DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431

09567863

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8063

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 32 OF 37 USPATFULL on STN

AN 2002:251128 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Skokie, IL, UNITED STATES
Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2002137072 A1 20020926

AI US 2001-976617 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8061

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits

comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 33 OF 37 USPATFULL on STN
 AN 2002:251127 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2002137071 A1 20020926
 AI US 2001-974007 A1 20011010 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
 GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
 Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8063

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 34 OF 37 USPATFULL on STN
 AN 2002:251126 USPATFULL

TI **Nanoparticles** having oligonucleotides attached thereto and
 uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2002137070 A1 20020926
 AI US 2001-973638 A1 20011010 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,
 GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
 PRAI US 1996-31809P 19960729 (60)
 US 2000-200161P 20000426 (60)
 DT Utility
 FS APPLICATION
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.
 Wacker Drive, Chicago, IL, 60606
 CLMN Number of Claims: 431
 ECL Exemplary Claim: 1
 DRWN 46 Drawing Page(s)
 LN.CNT 8060
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB The invention provides methods of detecting a nucleic acid. The methods
 comprise contacting the nucleic acid with one or more types of particles
 having **oligonucleotides** attached thereto. In one embodiment of
 the method, the **oligonucleotides** are attached to
 nanoparticles and have sequences complementary to portions of
 the sequence of the nucleic acid. A detectable change (preferably a
 color change) is brought about as a result of the **hybridization**
 of the **oligonucleotides** on the **nanoparticles** to the
 nucleic acid. The invention also provides compositions and kits
 comprising particles. The invention further provides methods of
 synthesizing unique nanoparticle-oligonucleotide conjugates, the
 conjugates produced by the methods, and methods of using the conjugates.
 In addition, the invention provides nanomaterials and nanostructures
 comprising **nanoparticles** and methods of
 nanofabrication utilizing **nanoparticles**. Finally, the
 invention provides a method of separating a selected nucleic acid from
 other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 35 OF 37 USPATFULL on STN
 AN 2002:235385 USPATFULL
 TI **Nanoparticles** having oligonucleotides attached thereto and
 uses therefor
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
 Letsinger, Robert L., Wilmette, IL, UNITED STATES
 Mucic, Robert C., Glendale, CA, UNITED STATES
 Storhoff, James J., Evanston, IL, UNITED STATES
 Elghanian, Robert, Skokie, IL, UNITED STATES
 Taton, Thomas A., Little Canada, MN, UNITED STATES
 PA Nanosphere, Inc. (U.S. corporation)
 PI US 2002127574 A1 20020912
 AI US 2001-973788 A1 20011010 (9)
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,

09567863

GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)
US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having **oligonucleotides** attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of **nanofabrication** utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 36 OF 37 USPATFULL on STN

AN 2002:60923 USPATFULL

TI Single-molecule selection methods and compositions therefrom

IN Cubicciotti, Roger S., Montclair, NJ, UNITED STATES

PI US 2002034757 A1 20020321

AI US 2001-907385 A1 20010717 (9)

RLI Continuation of Ser. No. US 1998-81930, filed on 20 May 1998, GRANTED, Pat. No. US 6287765

DT Utility

FS APPLICATION

LREP LICATA & TYRRELL P.C., 66 E. MAIN STREET, MARLTON, NJ, 08053

CLMN Number of Claims: 129

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 15716

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Single-molecule selection methods are provided for identifying target-binding molecules from diverse sequence and shape libraries. Complexes and imprints of selected target-binding molecules are also provided. The subject selection methods are used to identify oligonucleotide and nonnucleotide molecules with desirable properties for use in pharmaceuticals, drug discovery, drug delivery, diagnostics, medical devices, cosmetics, agriculture, environmental remediation, smart materials, packaging, microelectronics and nanofabrication. Single oligonucleotide molecules with desirable binding properties are selected from diverse sequence libraries and identified by amplification and sequencing. Alternatively, selected oligonucleotide molecules are identified by sequencing without amplification. Nonnucleotide molecules

with desirable properties are identified by single-molecule selection from libraries of conjugated molecules or nucleotide-encoded nonnucleotide molecules. Alternatively, target-specific nonnucleotide molecules are prepared by imprinting selected oligonucleotide molecules into nonnucleotide molecular media. Complexes and imprints of molecules identified by single-molecule selection are shown to have broad utility as drugs, prodrugs, drug delivery systems, willfully reversible cosmetics, diagnostic reagents, sensors, transducers, actuators, adhesives, adherents and novel multimolecular devices.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 37 OF 37 USPATFULL on STN
 AN 2001:152673 USPATFULL
 TI Methods for detecting and identifying single molecules
 IN Cubicciotti, Roger S., Montclair, NJ, United States
 PA Molecular Machines, Inc., Montclair, NJ, United States (U.S. corporation)
 PI US 6287765 B1 20010911
 AI US 1998-81930 19980520 (9)
 DT Utility
 FS GRANTED
 EXNAM Primary Examiner: Fredman, Jeffrey
 LREP Licata & Tyrrell P.C.
 CLMN Number of Claims: 27
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 15456

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Multimolecular devices and drug delivery systems prepared from synthetic heteropolymers, heteropolymeric discrete structures, multivalent heteropolymeric hybrid structures, aptameric multimolecular devices, multivalent imprints, tethered specific **recognition** devices, paired specific **recognition** devices, nonaptameric multimolecular devices and immobilized multimolecular structures are provided, including molecular adsorbents and multimolecular adherents, adhesives, transducers, switches, sensors and delivery systems. Methods for selecting single synthetic nucleotides, shape-specific probes and specifically attractive surfaces for use in these multimolecular devices are also provided. In addition, paired nucleotide-nonnucleotide mapping libraries for transposition of selected populations of selected nonoligonucleotide molecules into selected populations of replicatable nucleotide sequences are described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.